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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,652	04/02/2004	Charles Frederick Lloyd	144382NV (15427US01)	3370

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CHICAGO, IL 60661

EXAMINER
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WEATHERBY, ELLSWORTH

ART UNIT	PAPER NUMBER
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3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/11/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/817,652	<b>Applicant(s)</b> LLOYD ET AL.	
	<b>Examiner</b> Ellsworth Weatherby	<b>Art Unit</b> 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6-11 are rejected under 35 U.S.C. 102(b) as being anticipated by DiGioia III et al (U.S. Patent 5,880,976).

Regarding claims 1-4 and 6-7, Digioia III et al. '976 teaches a system for improved calibration of an instrument, the system comprising: an instrument for use in an image guided operation, the instrument tracked with respect to a reference coordinate system during the image-guided operation (abstract; col. 8, lines 33-59); a plurality of fiducials placed on the instrument, the plurality of fiducials enabling measurements of the instruments (col. 6, lines 54-67; col. 8, lines 33-59; col. 11, lines 24-38); a sensor for measuring the instrument, the sensor capable of being positioned with respect to one or more of the fiducials for measurement of one or more locations on the instrument and a tracking system for measuring one or more locations on the instrument using the sensor and the plurality of fiducials (col. 6, lines 54-67). Digioia III

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et al. '976 also teaches surface recognition for identifying fiducials (col. 8, lines 33-59).

Here, the examiner as interpreted the limitation of claim 2 to be met because the surface recognition technique would include recognizing indentations or grooves.

Digioia III et al. '976 further teaches that the sensor comprises at least one of an electromagnetic sensor or an optical sensor (col. 7, lines 3-20). Digioia III et al. '976 further teaches a measurement frame for positioning the instrument for measurement (col. 11, lines 39-49). Regarding claim 4, it is inherent that the tracking systems would be sterile tracking systems because they are disclosed as being used in an operating room during surgery. Digioia III et al. '976 also teaches comparing a calculated range of motion with a predetermined, theoretical model (col. 10, lines 54-67; col. 11 lines 1-8).

Regarding claims 8-11, Digioia III et al. '976 teaches a method for calibrating an instrument, the method comprising: placing a plurality of fiducials on an instrument (col. 6, lines 52-67); obtaining a plurality of measurements for the instrument using the plurality of fiducials (col. 8, lines 17-32); and forming a model of the instruments using the measurements for use in tracking the instrument (col. 8, lines 33-59). Digioia III et al. '976 also teaches generating a mathematical model of the instrument (col. 7, lines 40-54). Digioia III et al. '976 further teaches comparing the model and the mathematical model to determine a variation and tracking the instrument based on the variation (col. 7, lines 66-67; col. 8, lines 1-32).

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3. Claims 14, 16-18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Grimm et al. (PGPub No. 2004/0153191).

Grimm et al. '191 teaches a method for dynamic calibration of an instrument for use in an image guided operation, the method comprising: obtaining a plurality of measurements for the instrument using a plurality of fiducials on the instrument [0054]; determining a representation of the instrument in a reference coordinate system using the plurality of measurements for use in tracking the instrument [0050; 0052]; performing an image guided operation using an image data set and a dynamically updated representation of the instrument [0050-0052]. Grimm et al. '191 also teaches obtaining the plurality of measurement using the plurality of fiducials and a sensor [0051; 0052]. Grimm et al. '191 further teaches obtaining the plurality of measurements for the instruments using the plurality of fiducials in at least one image of the instrument [0052; 0056]. Regarding claim 18; it is inherent that the internal emitters and the tracking system would be sterile tracking systems because they are disclosed as being used in an operating room during surgery.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Digioia III et al. '976.

Digioia III et al. '976 teaches all the limitations of the claimed invention except for expressly teaching that the determining step further comprises determining a closed form registration for the instrument using the plurality of measurements. However, At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to determine a closed form registration for the instrument using the plurality of measurements because Applicant has not disclosed that comprises determining a closed form registration for the instrument using the plurality of measurements provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the invention of Digioia III et al. '976, and applicant's invention, to perform equally well with either the registration taught by Digioia III et al. '976 or the claimed closed form registration for the instrument because both registration methods would perform the same function of registering an object in a coordinate system.

Therefore, it would have been prima facie obvious to modify Digioia III et al. '976 to obtain the invention as specified in claim 1 because such a modification would have been considered a mere design consideration which fails to patentably distinguish over the prior art of Digioia III et al. '976.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Digioia III et al. '976 in view of Krause et al. (U.S. Patent No. 6,701,174).

Digioia III et al. '976 teaches all the limitations of the claimed invention including modeling an internal object and updating a model with current measurements of the internal object after it has changed shape (col. 10, lines 54-67; col. 11, lines 1-8). Digioia III et al. '976 does not expressly teach obtaining a plurality of measurements for the instrument after it has been deformed.

In the same field of endeavor, Krause et al. '174 further teaches updating the model with a plurality of measurements for the internal object after a deformation or a change in location (fig. 3; col. 12, lines 21-41).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Digioia III et al. '976 with Krause et al. '174. The motivation to modify would have been to match the current measurements to a template model such that the model substantially matches the geometry of the deformed object, as taught by Krause et al. '174.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm et al. '191.

Grimm et al. '191 teaches all the limitations of the claimed invention except for expressly teaching that the determining step further comprises determining a closed form registration for the instrument using the plurality of measurements. However, At the time the invention was made, it would have been an obvious matter of design choice

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to a person of ordinary skill in the art to determine a closed form registration for the instrument using the plurality of measurements because Applicant has not disclosed that comprises determining a closed form registration for the instrument using the plurality of measurements provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the invention of Grimm et al. '191, and applicant's invention, to perform equally well with either the registration taught by Grimm et al. '191 or the claimed closed form registration for the instrument because both registration methods would perform the same function of registering an object in a coordinate system.

Therefore, it would have been prima facie obvious to modify Grimm et al. '191 to obtain the invention as specified in claim 15 because such a modification would have been considered a mere design consideration which fails to patentably distinguish over the prior art of Grimm et al. '191.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm et al. '191 in view of Krause et al. (U.S. Patent No. 6,711,432).

Grimm et al. '191 teaches all the limitations of the claimed invention except for expressly teaching comparing a representation of the instrument and a computer-generated model of the instrument.

In the same field of endeavor, Krause et al. '432 teaches generating a template or ideal model of an internal object and comparing it to a current representation (col. 4, lines 33-42).



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It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Grimm et al. '191 with Krause et al. '432. The motivation to modify Grimm et al. '191 with Krause et al. '432 would have been to determine how much movement needs to occur to achieve a desired position, as taught by Krause et al. '432 (col. 4, lines 33-42).

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellsworth Weatherby whose telephone number is (571) 272-2248. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on (571) 272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EW

  
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SAG 3768